

CLAIMS

1. A gear unit for use in wind turbines of the kind having an integrated main rotor bearing and comprising a planetary gear stage, said integrated main rotor bearing being adapted to provide location for the rotor hub relative to the wind turbine nacelle and to locate the planet carrier relative to a low speed ring gear, wherein forces due to bending moments acting between the rotor hub and nacelle are transmitted substantially directly from the rotor hub to the nacelle via the main bearing and substantially none of said bending moments are transmitted to the nacelle via the ring gear of the planetary gear stage.
2. A gear unit according to claim 1 wherein no part of the planet carrier which is substantially in the same axial plane as a plane containing the planet gears transmits any said bending moments to the nacelle.
3. A gear unit according to claim 1 or claim 2 wherein the or each outer ring of the main rotor bearing is secured to the nacelle, and the rotor hub and planet carrier are secured to the inner ring(s) of the main bearing.
4. A gear unit according to any one of the preceding claims wherein said main bearing is a double taper roller bearing.
5. A gear unit according to claim 4 wherein said double taper roller bearing comprises two series of taper rollers arranged in an O configuration.
6. A gear unit according to claim 4 or claim 5 wherein said double taper roller bearing comprises a split inner ring.
7. A gear unit according to any one of the preceding claims wherein the outer ring(s) of the main bearing is secured substantially directly to the nacelle via a main bearing cover.
8. A gear unit according to any one of claims 1 to 6 wherein the main bearing is secured substantially directly to the nacelle via an intermediate housing.
9. A gear unit according to claim 8 wherein said intermediate housing is secured directly to the nacelle or to the outer ring of the main bearing.
10. A gear unit according to any one of the preceding claims wherein the planet gears lie axially displaced relative to the main bearing as considered in the direction of the axis about which the planet carrier rotates.

11. A gear unit according to any one of the preceding claims wherein the ring gear of the planetary gear stage is selectively releasably secured to the nacelle whereby at least the planet gears and ring gear may be dismantled without the need to remove the rotor.
12. A gear unit according to claim 11 wherein all parts of the gear unit except at least one of the main bearing and the planet carrier or a part thereof may be dismantled without the need to remove the rotor.
13. A gear unit according to claim 11 or claim 12 wherein the planet carrier is of a two part construction comprising one part to support the planet gears, said one part being selectively releasably secured to a second part of the planet carrier which is secured substantially directly relative to the main bearing.
14. A gear unit according to any one of the preceding claims wherein the main bearing is provided with a seal pack arranged to be selectively removeable in situ from the main bearing.
15. A gear unit according to claim 14 wherein said seal pack is displaceable axially relative to the main bearing.
16. A gear unit according to claim 14 or claim 15 wherein said seal pack comprises a circumferentially discontinuous seal.
17. A gear unit according to claim 1 and substantially as herein before described with reference to the accompanying drawings.